

[00012] Other devices for facilitating the submission of credit card and personal information include the so called "one click" systems present on the web sites of some vendors. These systems encourage users to submit their credit card and personal information in advance, to be held by the vendor or by a consortium of vendors. Then, when an individual wishes to make a purchase, they provide a user name and/or password to authenticate themselves to the vendor and then click with a mouse button or touch with a pen stroke, and the purchase is completed using the payment details stored with the vendor. However, these systems suffer the considerable disadvantage that the individual loses control over his or her personal information, as well as credit information, by having it stored on each individual vendor's database. This system also requires the user to remember a large number of different user name and password types and combinations, as most merchants have their own specific authentication methodology.

[00013] Another existing system for facilitating a similar type of process is . . . "gator.com" which takes a decentralized approach to automatic form filling. Basically, its users download a Windows utility that integrates with Microsoft's Internet Explorer. The main deficiency is that there is no security in place. Since all data is stored locally, anyone with access to that specific Windows computer can obtain specific secure information (Windows 9x is basically insecure during log-on). An additional weakness is that the system is not capable of making intelligent guesses regarding information that can be filled in on a form. The user is obligated to type in all the information, rather than letting the system input existing database information to speed up access to a new site based upon existing information. Every user who goes to a new site must complete all the fields even if many users prior to that have completed the same form and accessed the same database.

[00014] Accordingly, what would be desirable is the achievement of an automatic method for filling out forms in a way that preserves the privacy of the individual user by keeping personal information, credit card information, and the like safe and under the control of the user or the user's service provider. This automatic method for filling out forms also should greatly speed up such purchasing transactions. This automatic method for filling out forms should enable users to fill in data forms quickly and efficiently on commercial sites all over the Internet. This automatic method for filling out forms should eliminate the necessity of manually establishing a directory of merchant forms. This automatic method for filling out forms should be able to fill out forms from both known sites and completely new sites.

SUMMARY OF THE INVENTION

[00015] The present invention provides an automatic method for filling out forms in a way that preserves the privacy of the individual user by keeping personal information, credit card information, and the like safe and under the control of the user or the user's trusted service provider. It provides an automatic method for filling out forms that greatly speeds up purchasing transactions. It also enables users to fill in data forms quickly and efficiently on commercial sites all over the Internet. The present invention eliminates the necessity of manually establishing a directory of merchant forms. It also can fill forms from both known sites and completely new sites. It is self learning, and it improves performance on future occasions based upon historic results.

[00016] The present invention contemplates auto detection of vendor forms requesting such information, by the fact that they are marked as secure forms which are to be handled in an encrypted manner, and/or by the fact that they are "fill in the blank" type forms that are requesting information. These forms are diverted to a special system which, after authenticating the user and validating the web sites from which the forms come, obtains the user's personal and payment information from a secure site and attempts to fill out the form by the application of rules that indicate what user information goes into which blanks in the forms. If this effort is successful, an abbreviated version of the form is sent to the user for approval. Once the information is approved, then the completed form is submitted to the vendor's web site for processing. However, if the information required to complete the form is not identifiable based on pre-existing rules for that site, then an artificial intelligence system attempts to fill out the form using a set of known rules modified by the principles of fuzzy logic or artificial intelligence. If this also fails, then a history database is checked to see if the same form has been encountered and filled out previously. If so, the form is filled out with user information using the previously entered information as a guide. If the form is not found within the history database, then the incomplete sections of the form are presented to the user for manual completion.

[00017] After the user reviews and optionally revises the information in the form, the form is analyzed by the system. The information that the user filled in is saved in the history database to be used as a guide for automatic completion of this same form in the future. If the form was filled out using information in the history database as a guide, then rules for filling out that form are derived from matches in the two sets of user-entered information that have been gathered and are saved for future use, and the relevant sections of the form are then deleted from the history database. If artificial intelligence was used to complete the form, then any artificial intelligence rules that were developed by the fuzzy logic or artificial

intelligence system and that gave correct results are saved for later use in completing the same form and other forms. The fuzzy logic or artificial intelligence system is also advised of its performance so that it can make adjustments and improve its future performance.

[00018] The user's personal information and credit card information are maintained in a secure server under the control of the user's service provider and are not made available to vendor and other web sites except when a transaction is carried out and after the user authorizes the release of the information. Access to this personal information is not granted until the user has definitely been verified, either through special cookies placed upon the user's system or by means of an identifying user name and password. In addition, only the forms of vendors whose identity has been validated are filled out and submitted in this automated fashion.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[00019] Figure 1 is an overview block diagram of an automated personal information form fill software system in accordance with the principles of the present invention shown used in an Internet environment in conjunction with a personal computer (PC) and a wireless telephone or Personal Digital Assistant (PDA).

[00020] Figure 2 is a program element block diagram and data flow path diagram illustrating the operation of the form fill software system of Figure 1.

[00021] Figure 3 is a flow diagram of the steps performed by the data flow monitor of Figure 2.

[00022] Figure 4 is a flow diagram of the steps carried out by the form fill proxy of Figure 2.

[00023] Figure 5 is a continuation of Figure 4 showing additional steps carried out by the form fill proxy.

[00024] Figure 6 is a flow diagram of the steps performed by the match engine of Figure 2.

[00025] Figure 7 is a continuation of Figure 6 showing additional steps performed by the match engine.

[00026] Figure 8 is the flow diagram illustrating the steps carried out by the completed form analysis engine of Figure 2.

[00027] Figure 9 is a flow diagram of a program that saves forms in a history database shown in Figure 2.

[00028] Figure 10 illustrates the data structure of the dictionary database of Figure 2.

[00029] Figure 11 illustrates the data structure of the wallet database of Figure 2.